



Allen-Bradley

Integrating DeviceNet into ProcessLogix*

1756-DNB, 1757 Series

***ProcessLogix R510.0 and above.**

Application Technique

**Rockwell
Automation**

Important User Information

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Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.

ATTENTION



Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss.

IMPORTANT

Identifies information that is critical for successful application and understanding of the product.

	Important User Information	ii
Preface	Minimum Hardware Requirements for ProcessLogix R510.0 .	Preface-1
	ProcessLogix Online User Documentation and Knowledge Builder.	Preface-1
	Terminology	Preface-1
	Conventions	Preface-3
	Terms and Type Representations	Preface-3
	Chapter 1	
Introduction	Prerequisites	1-1
	General Checklist to Configure a 1756-DNB in ProcessLogix	1-1
	1756-DNB DeviceNet Interface Module	1-2
	Example Topology for Integrating DeviceNet into ProcessLogix R510.0	1-3
	DeviceNet Interface to a Non Redundant Controller	1-3
	DeviceNet Interface to a Redundant Controller	1-4
	System Performance, Capacity and Topology Specifications.	1-5
	Chapter 2	
ProcessLogix R510.0 Function Block Set Architecture	DeviceNet Library	2-1
	DNETIF Library	2-1
	Function Block Set.	2-2
	DNET_IM	2-2
	DNET_DEVICE	2-2
	DNET_INCHAN	2-2
	DNET_OUTCHAN	2-3
	Configuration Tools.	2-3
	1756-DNB	2-3
	DNETIF Library	2-3
	DeviceNet Wizard	2-3
	DeviceNet Network Configuration	2-3
	Chapter 3	
Using the 1756-DNB and ProcessLogix to Communicate with Flex I/O	Prerequisites	3-1
	Getting Started in Control Builder	3-1
	Creating and Configuring the CPM.	3-2
	Creating a DNET_IM Module	3-2
	Locate Mapping Data from RSNetworkx.	3-8
	Create a DNET_DEVICE	3-14
	Configure Input and Output Channels.	3-19
	Create a new CM	3-19
	Set-up communication with the 1794-IE8/1794-OE4 pair	3-20
	Input Channel	3-20
	Output Channel	3-21

Set-up communication with the 1794-IB32/1794-OB32 pair..	3-23
Input channels	3-23
Output Channels	3-24
Set-up communication with the 1794-IF4I/1794-OF4I pair...	3-25
Input Channels	3-26
Output Channels	3-26

Troubleshooting

Chapter 4

Hardware	4-1
1756-DNB	4-1
DNB Error Codes	4-1
Software	4-1
RSNetworkx for DeviceNet	4-1
Changing Hardware	4-1
Control Builder	4-1
Device is red but IM is green	4-1
Configuration mismatch error on download	4-1
Data not reflected in module or device	4-1

Backcover

Rockwell Automation Support	BC
Installation Assistance	BC
New Product Satisfaction Return	BC

Minimum Hardware Requirements for ProcessLogix R510.0

The DeviceNet Interface Library is only supported by ProcessLogix R510.0.

ProcessLogix R510.0 Server Software must be installed on a PC that is specifically qualified. Use of any other PC variations will render the standard warranty and support agreement null and void.

ProcessLogix Online User Documentation/Knowledge Builder

ProcessLogix online user documentation is included with your ProcessLogix system in browser format through the *Knowledge Builder*. Most of the documents may also be ordered individually through Rockwell Automation in print format, visit us at: www.theautomationbookstore.com.

Knowledge Builder provides the user with task-based documentation within the Server and Client stations and may be accessed while using any of ProcessLogix's software programs. *Knowledge Builder's* internal links and search functions allow the user to access process relevant information and references.

References to Knowledge Builder throughout this document are illustrated as:

Navigate in Knowledge Builder to *Ethernet Implementation Guide*⇒*Configuration*⇒*Setting Up Drivers and IP Addresses* for more information.

Terminology

Table P.1 Terminology used in this Application Technique

Term	Definition
CNB	ControlNet Interface Module
ICP	Integrated Control Platform
CEE	Control Execution Environment
IOC	Input Output Channel
IOM	Input Output Module
IOC FB	Input Output Channel Function Block
IOM FB	Input Output Module Function Block

Table P.1 Terminology used in this Application Technique

Term	Definition
DNET	DeviceNet Interface Module, specifically the 1756-DNB
ODVA	Open DeviceNet Vendor Association They provide comprehensive DeviceNet support and documentation, contact www.odva.com . You can also refer to www.theautomationbookstore.com to order or download Devicenet documentation from Rockwell. Such as the DeviceNet Planning and installation Guide, DeviceNet Overviews and Selection Guides and well as a DeviceNet Starter Kit.
EDS	Electronic Data Sheets .dll's that RSNetWorx requires to be able to identify the devices. You can obtain these files in many ways. Shipped with device, through the manufacturers web site and for many are at www.ab.com .

Conventions

Terms and Type Representations

The following table summarizes the terms and type representation conventions used in this Guide.

Term/Type Representation	Meaning	Example
click, click on, click [button name]	Click left mouse button once. (Assumes cursor is positioned on object or selection.)	Click Browse.
double-click	Click left mouse button twice in quick succession. (Assumes cursor is positioned on object or selection.)	Double-click the Station icon.
drag	Press and hold left mouse button while dragging cursor to new screen location and then release the button. (Assumes cursor is positioned on object or selection to be moved.)	Drag the PID function block onto the Control Drawing.
right-click	Click right mouse button once. (Assumes cursor is positioned on object or selection.)	Right-click the AND function block.
select	click to highlight a menu item or list choice, or click on a button.	Select Configure Allen-Bradley drivers from the list box.
<F1>	Keys to be pressed are shown in angle brackets.	Press <F1> to view the online Help.
<Ctrl>+<C>	Keys to be pressed together are shown with a plus sign.	Press <Ctrl>+<C> to close the window.
File⇒New	Shows menu selection as menu name followed by menu selection.	Click File⇒New to start new drawing.
>D:\setup.exe<	Data to be keyed in at prompt or in an entry field.	Enter this path location >D:\setup.exe<.

Notes:

Introduction

Prerequisites

This document describes how to define, configure and monitor a DeviceNet network using the DeviceNet Interface Library. This Quick Start assumes that you have an understanding of basic Control Builder terminology, control strategies as well as an understanding of DeviceNet terminology and configuration tools.

The following checklist describes what is required of you before you begin integrating a DeviceNet Device into your ProcessLogix R510.0 system.

General Checklist to Configure a 1756-DNB in ProcessLogix

Table 1.A General Checklist to Configure a 1756-DNB in ProcessLogix

✓	You must have:
	Purchased or upgraded to appropriate hardware to run ProcessLogix R510.0.
	ProcessLogix R510.0 with the DNET Interface Library installed. • The DNET Library is integrated into ProcessLogix R510.0. • If you have purchased the ProcessLogix Hardware from Rockwell Automation, this library has been installed on the Server shipped from the factory. • If you are upgrading existing hardware or using your hardware configured to ProcessLogix R510.0 specifications, then follow the installation instructions in the ProcessLogix R510.0 Installation and Upgrade Guide, publication 1757-IN510A-EN-P.
	A DeviceNet network, wired properly and working.
	All devices on the DeviceNet network assigned to the DeviceNet interface module and no errors are showing in the LED display.
	A working knowledge or have access to the support of a person with working knowledge of Control Builder and RSNetWorx for DeviceNet.
	RSNetWorx installed and running properly on your development machine.
	RSNetWorx configuration information: • Input mapping • Output mapping

Table 1.A General Checklist to Configure a 1756-DNB in ProcessLogix

✓	You must have:
	Slot locations of 1756-DNBs that you plan on monitoring through ProcessLogix • Controller locations • Device Addresses
	Experience programming Function Blocks in Control Builder • Attend hands-on training classes • Obtain help from a knowledgeable source
	Identified or installed the 1756-DNB.

1756-DNB DeviceNet Interface Module

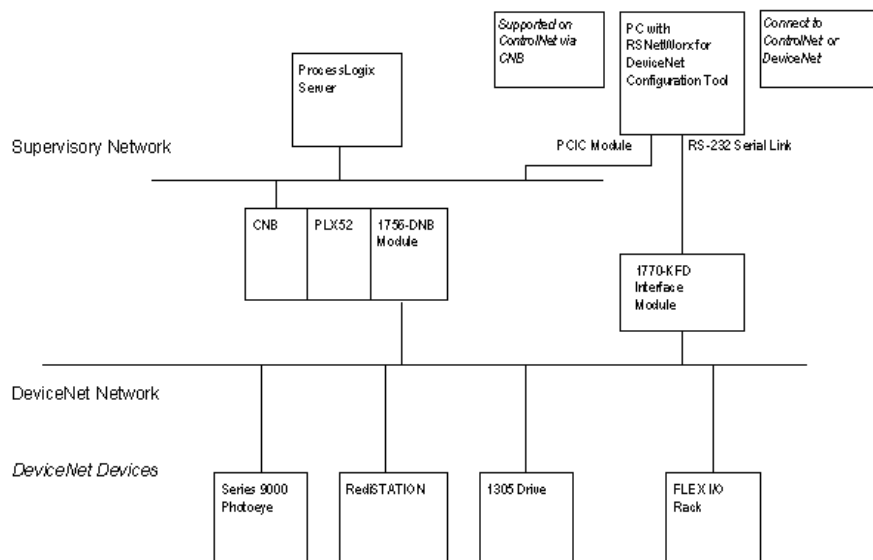
The 1756-DNB:

- provides a communication bridge between ControlNet and DeviceNet
- utilizes the Rockwell 1756 form factor, which is native to ProcessLogix
- can be located in either the ProcessLogix Controller Rack or I/O Rack
- supports the three DeviceNet baud rates: 500 KBps, 250 KBps and 125KBps.
- is configured from a PC running the RSNetWorx for DeviceNet configuration tool connected to either DeviceNet through a 1770-KFD Interface Module or ControlNet through a CNB.
- input and output messages from/to the various DeviceNet devices are bundled at the ControlNet level into 2 assemblies (data objects) which are available for transport across ControlNet from/to the 1757-PLX52 Controller:
 - as configured with the DeviceNet network configuration, all input data messages (from DeviceNet input devices) are packed into a 496 byte input assembly. Input data is bound from input devices to the 1757-PLX52 Controller.
 - as configured with the DeviceNet network configuration, all output data messages (to DeviceNet output devices) are packed into a 492 byte output assembly. Output data is bound from the 1757-PLX52 Controller to the output device.

Example Topology for Integrating DeviceNet into ProcessLogix R510.0

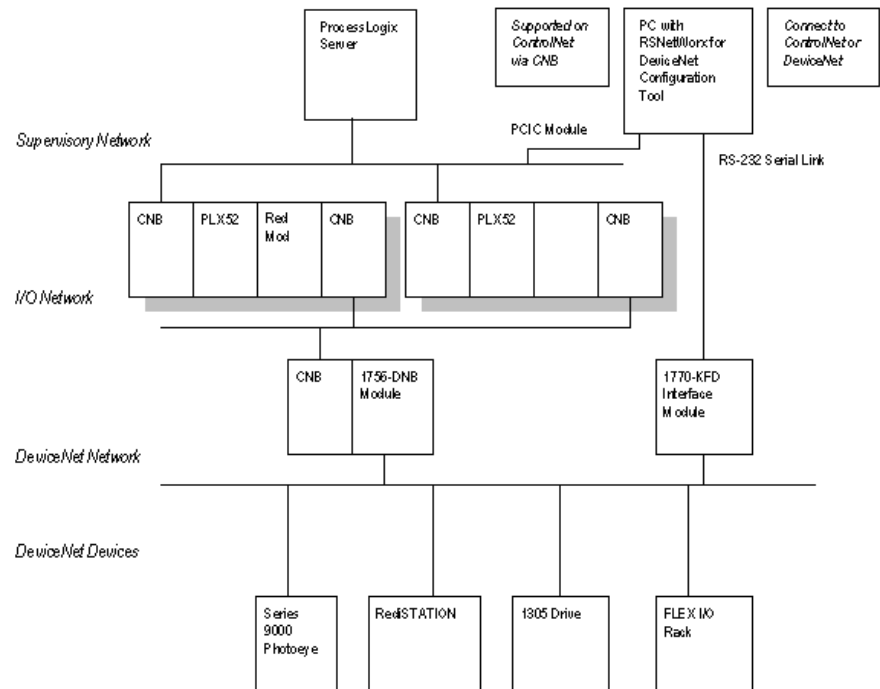
The DeviceNet Interface module can be supported in both Redundant and Non-Redundant Controller topologies. The following diagrams depict the intended ProcessLogix DeviceNet interface in these hardware topologies.

DeviceNet Interface to a Non Redundant Controller



- The 1756-DNB is the DeviceNet Interface module.
- The PC with the RSNetWorx Configuration Tool is used to configure the DeviceNet Interface Module and the DeviceNet network.
- Although ControlNet is depicted for the supervisory network, Ethernet supervisory networks are also possible.
- In a non-redundant configuration the 1756-DNB may reside in the controller chassis or in the I/O chassis.
- Although only one DeviceNet Interface is shown, a PLX controller can host multiple modules. Refer to 1-5.

DeviceNet Interface to a Redundant Controller



- The 1756-DNB is the DeviceNet Interface module.
- The PC with the RSNetWorx Configuration Tool is used to configure the DeviceNet Interface Module and the DeviceNet network.
- In a redundant configuration the DeviceNet Interface resides in the I/O chassis. There are no Ethernet modules qualified for use with SRM's.
- Although only one DeviceNet Interface is shown, a PLX controller can host multiple modules. Refer to 1-5.

System Performance, Capacity and Topology Specifications

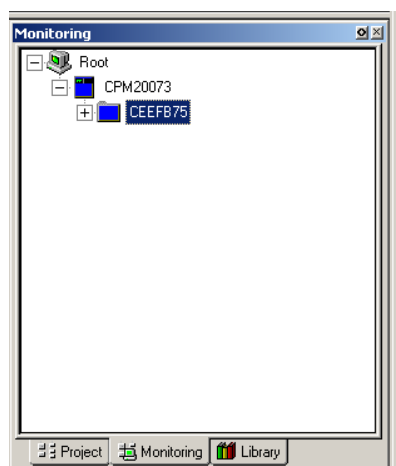
Following are the performance, capacity and topology specifications applicable when implementing the DeviceNet Interface in a ProcessLogix system. The information in this section is intended to supplement the ProcessLogix Installation and Upgrade Guide. For more information about Integrating DeviceNet and ProcessLogix, navigate in Knowledge Builder to *CCL Help* ⇒ *DeviceNet Interface*.

The 1756-DNB is not a redundancy compliant device and therefore cannot be introduced into a controller rack of a redundant controller configuration. However in non-redundant applications, the module can be deployed in either the controller rack or a downlink I/O rack.

- The communication update interval between the DeviceNet Interface and the DNET_IM block is not configurable, but is dependant upon the Base Execution Rate of the CEE in which the block is running.

Table 1.2

CEE Base Execution Rate	Input Rate	Output Rate
50 Ms	25 Ms	25 Ms
5 Ms	5 Ms	5 Ms



- Up to four 1756-DNB modules can reside in the local rack and/or in a remote rack. This configuration has been tested and is currently supported.
- The DNET_IM block supports communication to a maximum of 64 unique DeviceNet devices, identified by a unique network address within the valid network address range of 0-63.
- The DeviceNet Interface imposes the following constraints, which may restrict the number of DeviceNet devices supported:
 - The sum of all input message sizes from all input devices cannot exceed 496 bytes.
 - The sum of all output message sizes from all output devices cannot exceed 492 bytes.
- Regarding the existing system limit of 64 IOM connections per PLX and 24 IOM's per downlink CNB:
 - The DNET_IM block is the equivalent of 2 IOM's in this calculation
 - The DNET_DEVICE blocks that are associated with a given DNET_IM block are not counted in these limits. (Only the associated DNET_IM block is counted.)
- Supported DeviceNet baud rates: 500 KBps, 250 KBps and 125KBps

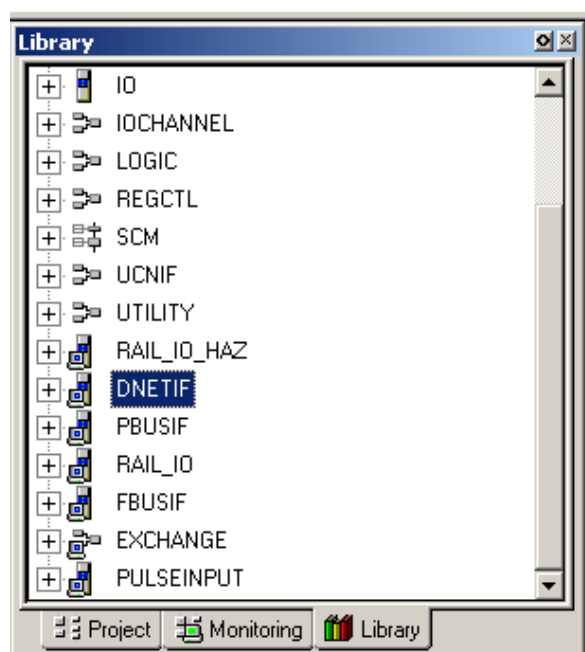
Notes:

ProcessLogix R510.0 Function Block Set Architecture

DeviceNet Library

The set of function blocks that comprise the ProcessLogix DeviceNet library are packaged as a Control Component Library (CCL). The CCL requires ProcessLogix R510.0 to run.

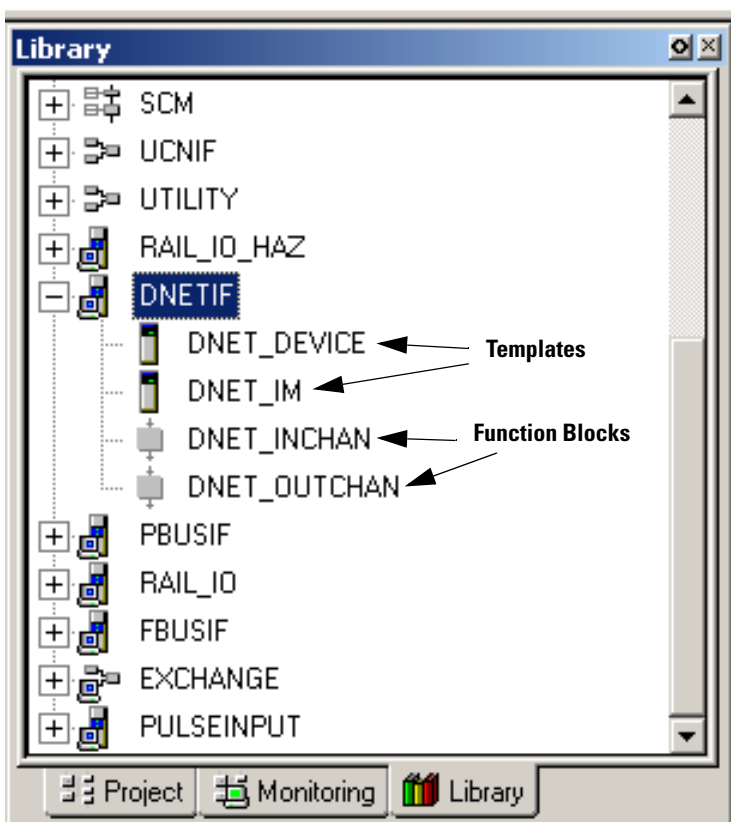
DNETIF Library



All DeviceNet blocks are contained in the DNETIF (DeviceNet Interface) library of the ProcessLogix database.

Function Block Set

The DNETIF library comprises the following blocks:



DNET_IM

DNET_IM is a template, an IOM block that represents a DeviceNet Interface module. This template allows ProcessLogix to communicate/monitor a DeviceNet device via the 1756-DNB, such as any I/O, Flex, or MicroLogix.

DNET_DEVICE

DNET_DEVICE is a template, a generic block that represents a DeviceNet device present on the DeviceNet network connected to the DeviceNet Interface Module.

DNET_INCHAN

DNET_INCHAN is a generic input channel block template that represents individual input data read from the DeviceNet devices. This block can be configured to create an interface to all DeviceNet devices. Simply, this function block receives input data from the 1756-DNB that has been sent from the DeviceNet device.

DNET_OUTCHAN

DNET_OUTCHAN is a generic output channel block template that represents individual output data to the DeviceNet devices. This block can be configured to create an interface to all DeviceNet devices. Simply, this function block sends output data from ProcessLogix to the device through a 1756-DNB.

Configuration Tools

Each of the affected hardware components in the ProcessLogix/DeviceNet architecture require the use of specific configuration tools as listed in the table below:

Table 2.1 Configuration Tools

Component	Configuration Tool
1756-DNB Module	RSNetworks for DeviceNet
DeviceNet Devices	RSNetworks for DeviceNet
All ProcessLogix Blocks	ProcessLogix Control Builder
DeviceNet I/O Module Function Blocks	DeviceNet Wizard, optional

1756-DNB

Verify that your Rockwell 1756-DNB DeviceNet Interface Module is at firmware release 3.010 or later.

DNETIF Library

Use of the DeviceNet Interface module with the DNETIF library requires the purchase of one license for each interface module used.

DeviceNet Wizard

The ProcessLogix DeviceNet Wizard takes the report file of the network created in RSNetworkx and creates Device and IM blocks that can be imported into ControlBuilder. Navigate in Knowledge Builder to *ProcessLogix R510*⇒*CCL Help*⇒*DeviceNet Interface* for detailed information.

DeviceNet Network Configuration

The DeviceNet network is configured using the RSNetworks for DeviceNet configuration tool. This tool, including supporting documentation is purchased as a separate license. Although this document includes some examples of DeviceNet configuration, it does not attempt to duplicate the information provided in the RSNetworks for DeviceNet or any other DeviceNet documentation.

Notes:

Using the 1756-DNB and ProcessLogix to Communicate with Flex I/O

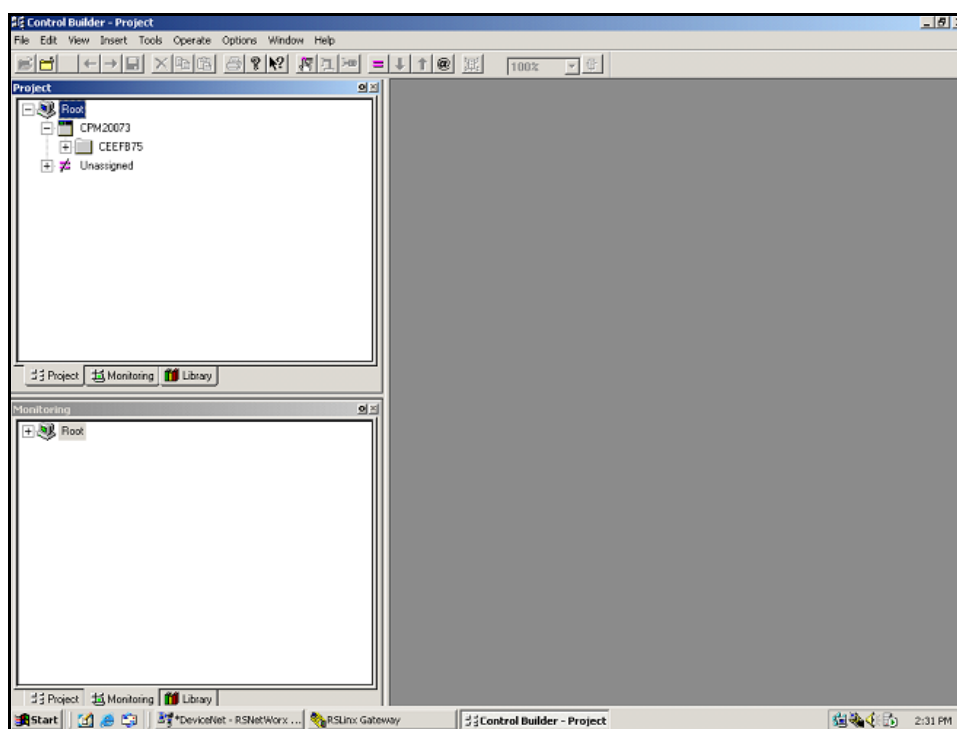
Prerequisites

The following checklist describes what is required of you before you begin integrating a DeviceNet device into your ProcessLogix R510.0 system.

✓	Step	Item	Refer to:
	1.	Getting Started in Control Builder	3-1
	2.	Creating and Configuring the CPM	3-2
	3.	Creating a DNET_IM Module	3-2
	4.	Locate Mapping Data from RSNetworx	3-8
	5.	Create a DNET_DEVICE	3-14
	6.	Configure Input and Output Channels	3-19

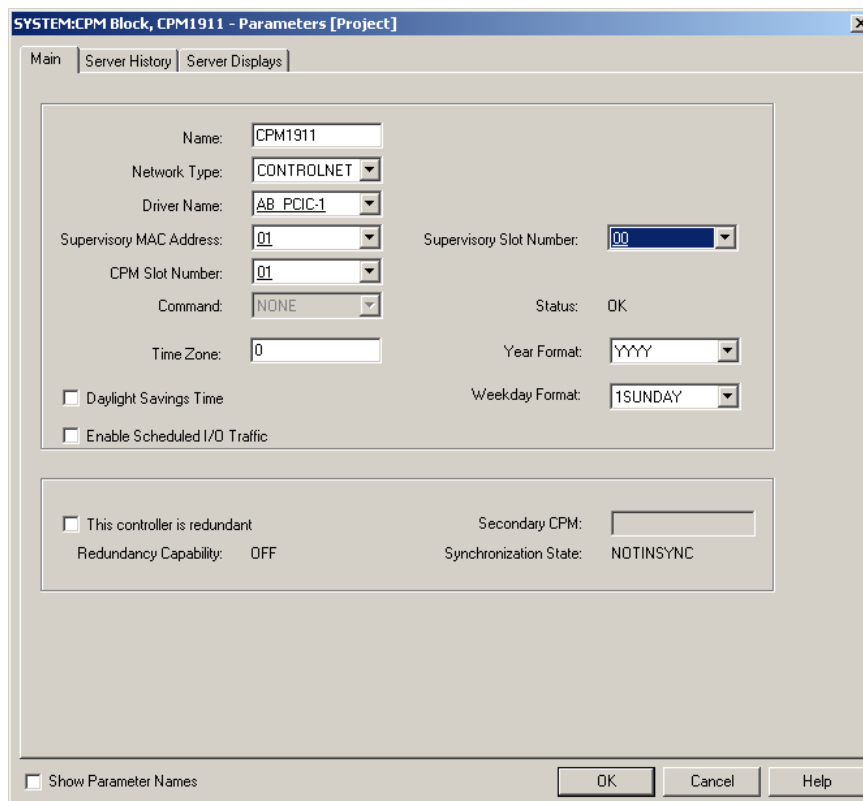
Getting Started in Control Builder

1. Open Control Builder.
2. In Control Builder, have two tree windows open:
 - Project
 - Monitoring



Creating and Configuring the CPM

3. Create a CPM, (ProcessLogix Controller representation) if you don't already have one to use, select **File** ⇒ **New** ⇒ **Controllers** ⇒ **CPM**.
4. Configure the CPM, enter the required information.

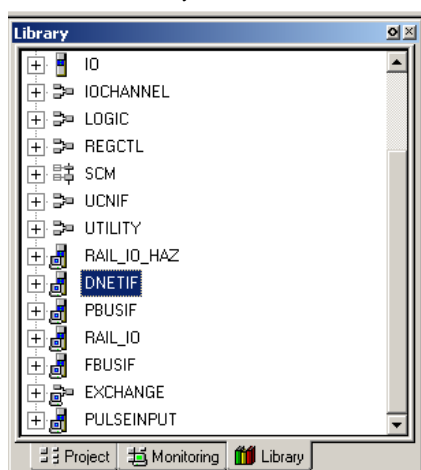


5. Download the CPM.

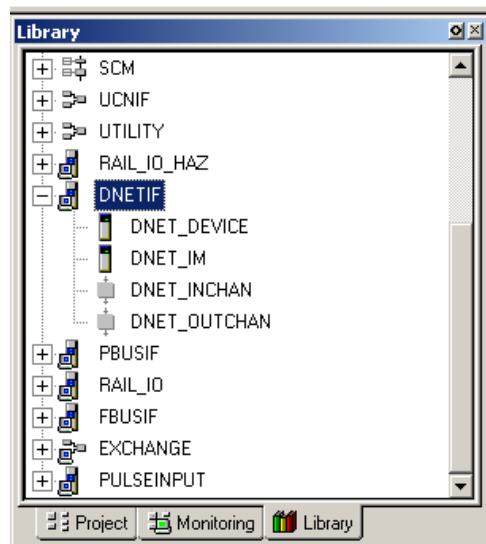
Creating a DNET_IM Module

This procedure will create a representation of the 1756-DNB Module in the I/O list for the CPM.

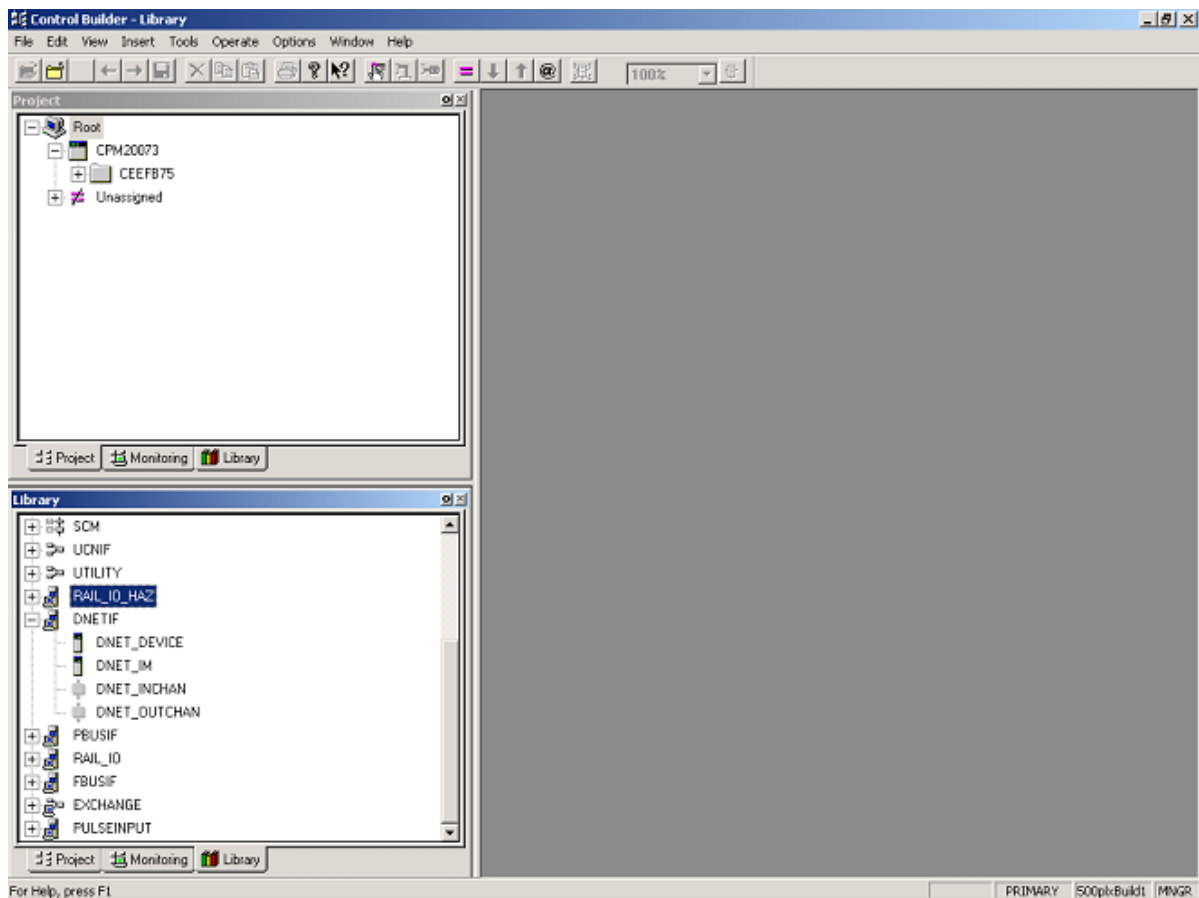
1. Select the Library tab.



2. Find and expand DNETIF library.

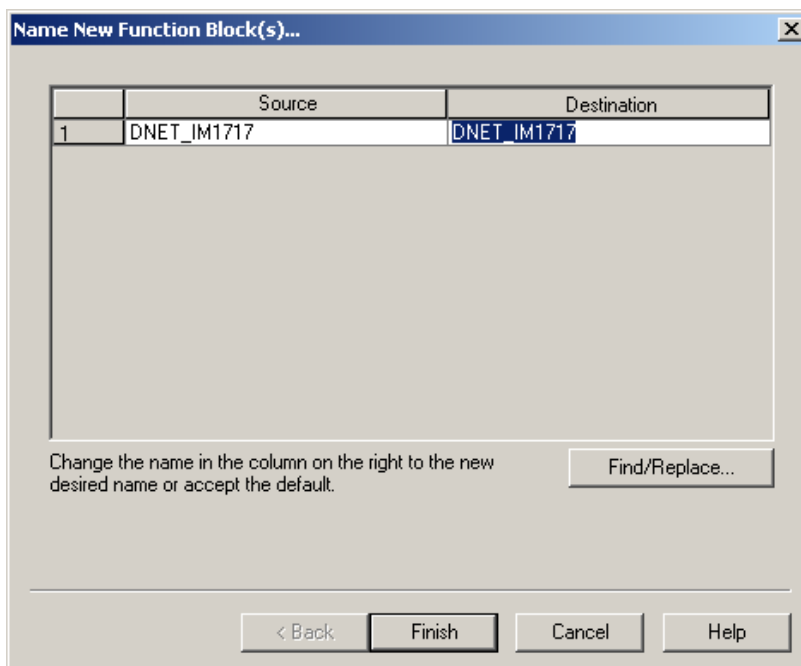


You see:



3. Select the DNET_IM and drag it on to the CEE in the Tree Window Project Tab.

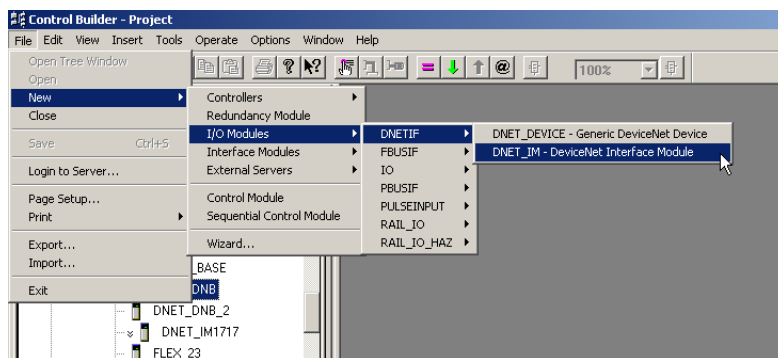
You see:



TIP

To create a new DNET_IM, you can use the menus instead of dragging the DNET_IM onto the CEE:

Select **File** ⇒ **New** ⇒ **I/O Modules** ⇒ **DNETIF** ⇒ **DNET_IM - DeviceNet Interface Module**.



Then assign it to the appropriate CEE.

4. Click **Finish**.
5. Expand the CEE.
6. Expand the I/O modules.
7. Double-click on the DNET_IM that was just created.

You will see.

8. Create a name.

9. Enter the rack address of the 1756-DNB module that you want to communicate with. The other fields are used for remote rack locations.

10. Select the Interface Module tab.

You see:

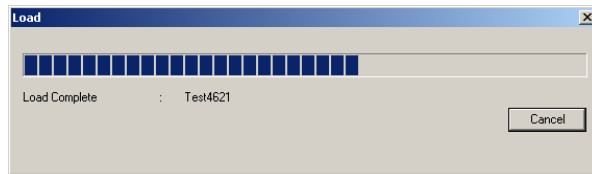
11. Enter the information for the DeviceNet Address of the 1756-DNB.

12. Click **OK**.

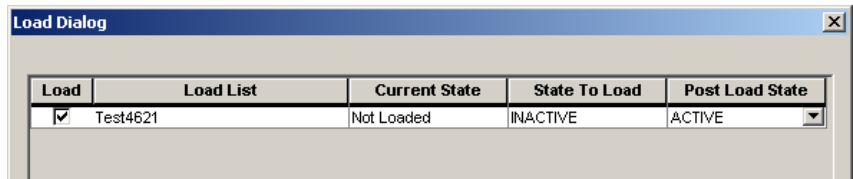
13. Go to the Project tab window.

14. Select the DNET_IM that you configured.

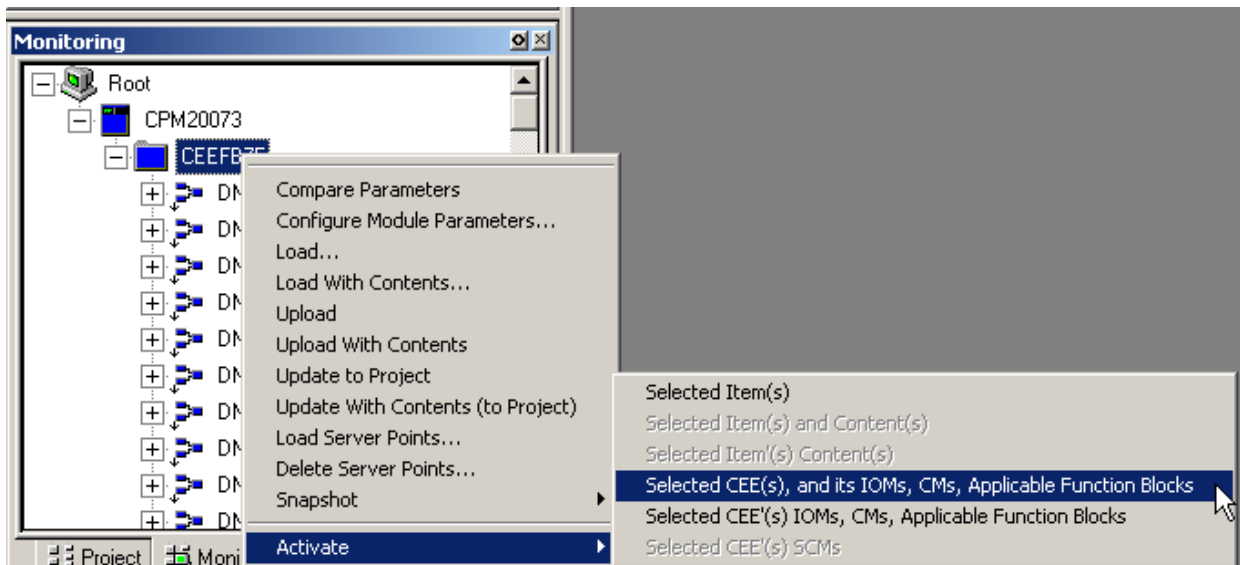
Download the DNET_IM to the processor by clicking .



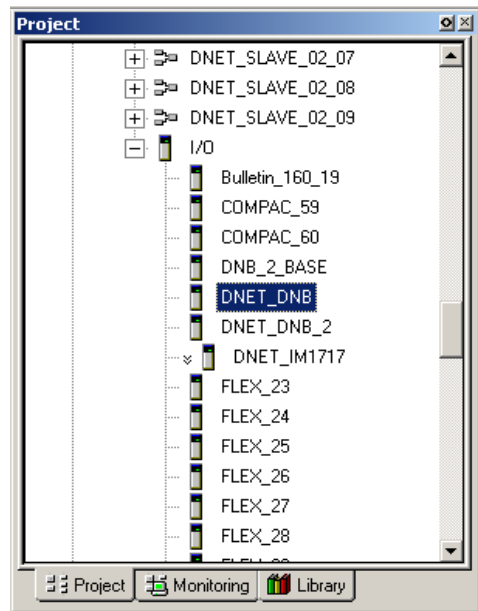
You see the item loaded:



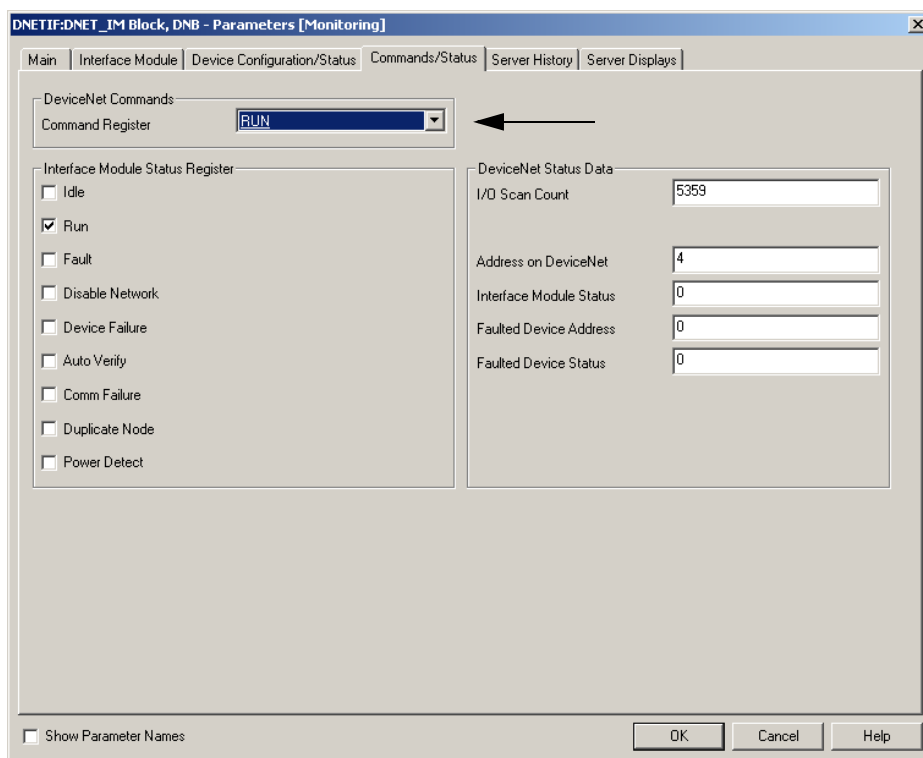
15. Click **OK**.
16. Go to the Monitoring tab window.
17. Select the CEE.
18. Activate the CEE either by right clicking and selecting the following:



19. Go to the I/O section and verify that the DNET_IM is green.
20. Double-click on the selected DNET_IM.



21. Go to the Command Status tab and change the Command Register from Idle to Run Mode.

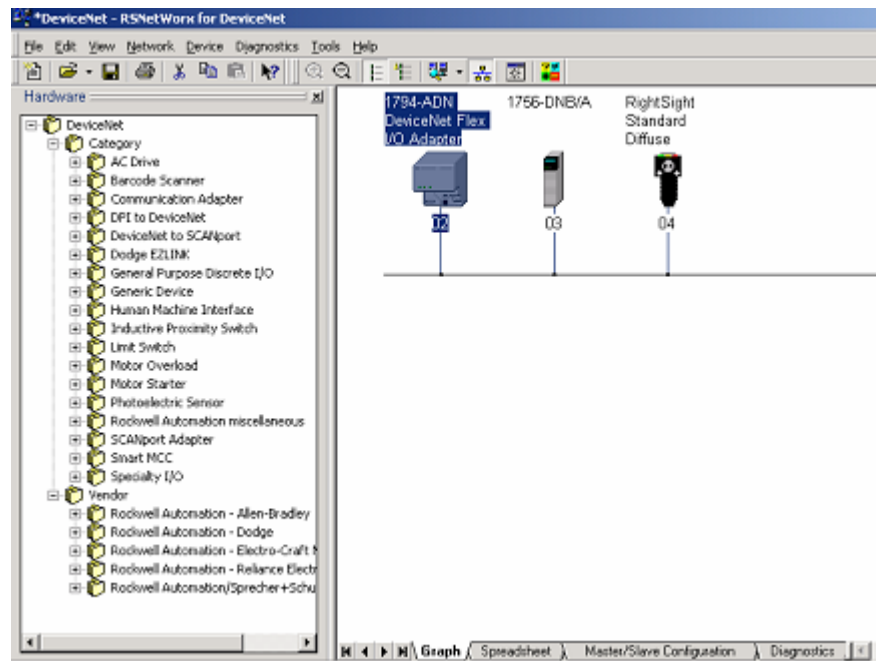


Locate Mapping Data from RSNetworkx

RSNetworkx for DeviceNet can indicate where all data is mapped.

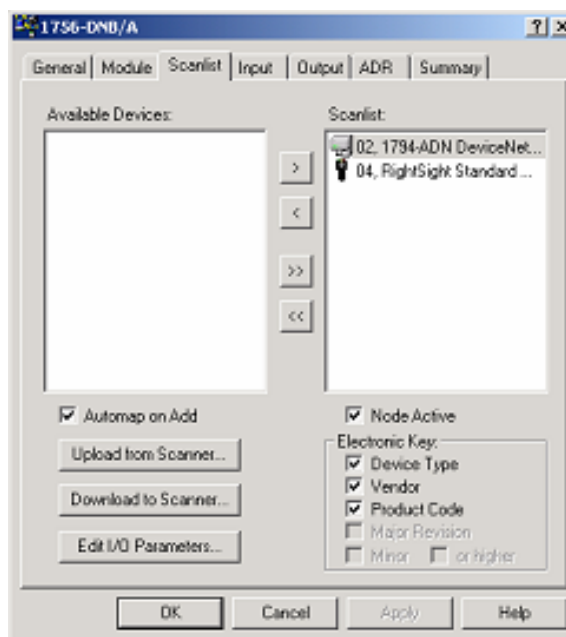
1. Go to RSNetworkx for DeviceNet

2. Go Online by clicking this button, , in toolbar.



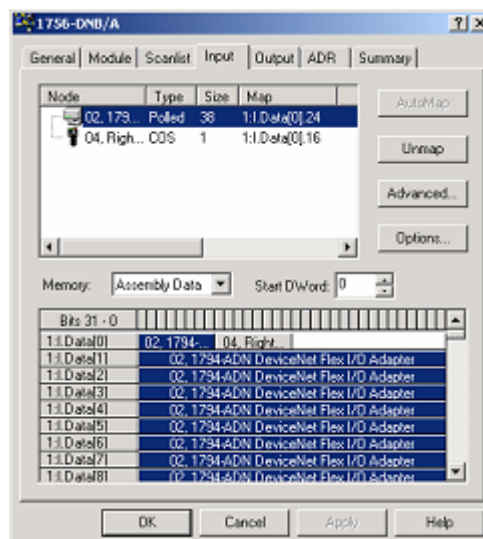
Your screen should display a network similar to this one.

3. Double click the 1756-DNB icon and select the Scanlist tab



A 1794-ADN (Flex I/O DeviceNet adapter) is already in the Scanlist for 1756-DNB. If it is not, use the arrow buttons to assign it to your DeviceNet interface module.

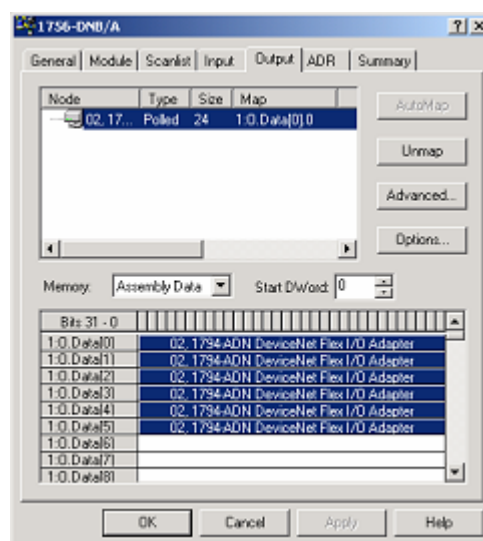
4. Click **Apply**, if changes have been made, to download these changes to the DNB module.
5. Click on the Input tab to access the mapping data for the input assembly of the DNB.



The Input tab shows where the data is located in the DeviceNet interface modules' memory. The 1794-DNBs input assembly has these characteristics:

Data Offset (Double Words): 0
 Data Offset (Bits): 24
 Length (Bits): 304 (38 bytes*8 bits per byte)

- Click the Output tab to view the output data assembly.

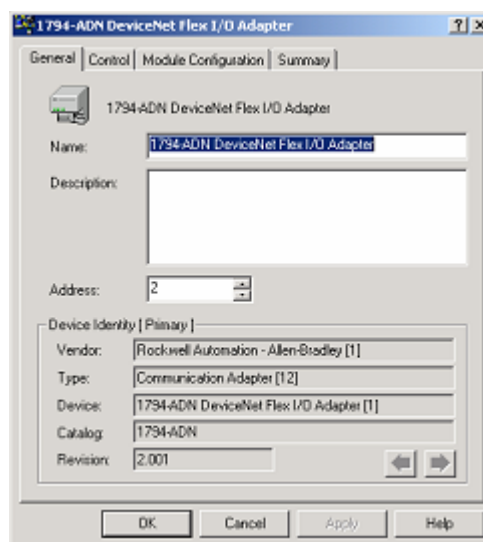


From RSNetworkx, the data assemblies are assigned as one large chunk. The memory space of each individual module is not delineated in the memory of the DNB. The output assembly for the ADN has these characteristics:

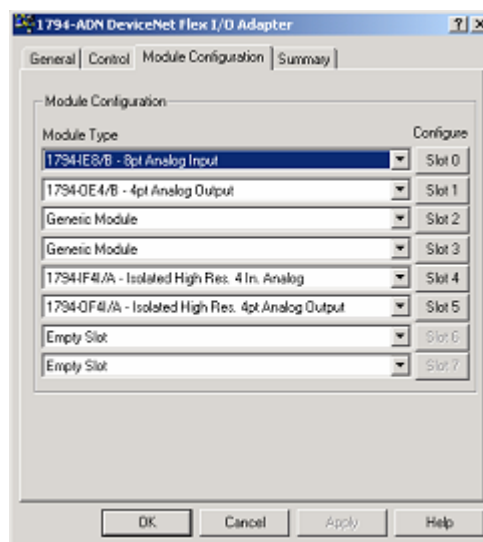
Data Offset (Double Words): 0
 Data Offset (Bits): 0
 Length (Bits): 192 (24bytes*8 bits per byte)

To see how the individual Flex I/O modules are mapped you need to view the memory of the ADN.

7. Double click on the ADN icon in the network display screen to see its configuration

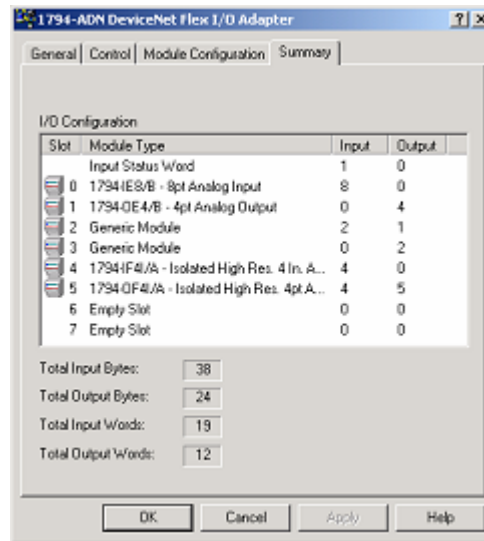


8. Click the Module Configuration tab to view the Flex I/O modules



From the Module Configuration tab each module can be configured (channel config, mode, etc.). The two Generic Modules seen here are a 1794-IB32 and a 1794-OB32. Even though RSNetworx does not recognize these modules, we are able to use them via DeviceNet.

9. Click the Summary tab to see the data mapping for each module.



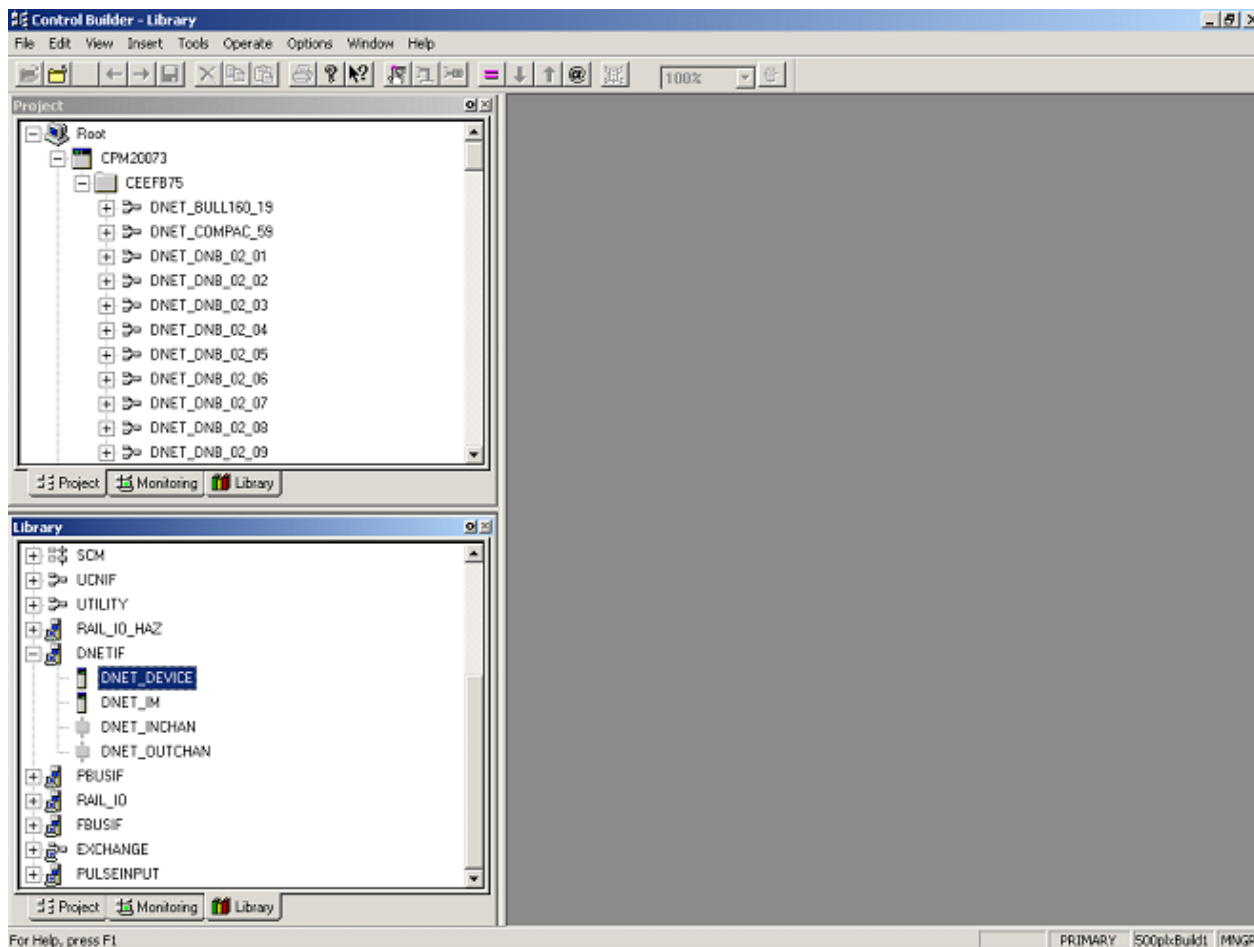
The Summary tab explains exactly where you need to point to in the DeviceNet interface modules' memory to access each Flex I/O module. You now have sufficient data from RSNetworkx to setup your DNET_DEVICE block properly in ProcessLogix.

Create a DNET_DEVICE

Now that you have a working DNET_IM module, you need to create a DNET_DEVICE that will be associated with the new DNET_IM.

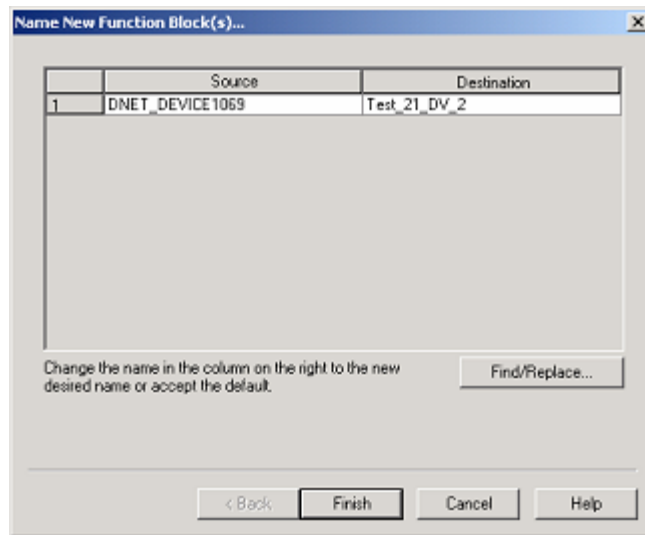
1. Go to the Library tab window.
2. Locate DNETIF and then DNET_DEVICE.

You see:



3. Select the DNET_DEVICE and drag it up to the CEE in the Project tab window.
4. Click **File** ⇒ **New** ⇒ **DNETIF** ⇒ **DNET_DEVICE**.

5. Give your DNET_DEVICE a unique name.



6. Click **Finish** to continue (for this example the name of the device is Test_21_DV_2).
7. Double click on the new icon for Test_21_DV_2 in the project window.

You see:

DNETIF:DNET_DEVICE Block, Test_21_DV_2 - Parameters [Project]

Main | Module Configuration | Server History | Server Displays

Module Name:

Module Description:

I/O Module Information

Module Type:

Currently Assigned Channels:

Channel Number	Channel Name
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

I/O Rack Addresses

☐ Show Parameter Names

OK Cancel Help

8. Enter a Description.
9. Select the Module Configuration tab.

You see a similar screen.

DeviceNet I/F Module Name: Execution State:

Device Address: Device Status:

☒ Alarming Enabled

Input Data Format

	Data Offset (DWords)	Data Offset (Bits)	Data Length (Bits)
0	0	0	0
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0

Output Data Format

	Data Offset (DWords)	Data Offset (Bits)	Data Length (Bits)
0	0	0	0
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0

☐ Show Parameter Names

OK Cancel Help

10. Enter the DeviceNet I/F Module Name as the name of the DNET_IM that has this DeviceNet device (Test_21_DV_2) in its scanlist. This example is DNET_IM module is Test 4621.
11. Enter the DeviceNet Address of the 1794-ADN. Refer to Locate Mapping Data from RSNetworkx on page 3-8.
12. Enter the Input Data Format. refer back to page 3-11, where we recorded this data from RSNetworkx.

In this example the correct information has been entered. The input assembly does not need to be separated by device because you can read data from the DeviceNet interface module as many times as you want, it does not interfere with the communication to and from the device.

IMPORTANT

This screen may read Data Offset (Words); however, this is a reference to a data size of 32 bits and is changed in R510.0 to read Data Offset (Double Words).

Data Offset (Double Words): 0
 Data Offset (Bits): 24
 Length (Bits): 304 (38 bytes*8 bits per byte)

13. For the output data assembly you need to separate the large chunk of data into module specific chunks. You need to have one space for OE4 data, one space for the OB32 data, and one space for the OF4I data. This allows you to write to all three data spaces simultaneously with no overlap.

The scanlist information from RSNetworkx tells us the size and location of the entire chunk of data.

Data Offset (Double Words):	0
Data Offset (Bits):	0
Length (Bits):	192 (24 bytes *8 bits per byte)

Information from the 1794-ADN further defines the spaces of memory to create. Refer to the Summary tab example in Step 9 on page 9. Based on the data shown here, this configuration provides access to each Flex output module. Following is the data provided in the example:

- | | | | | | | | |
|-----------------------------|---|-----------------------------|---|---------------------|----|----------------|---|
| OE4 | <p>This module appears at the beginning of the output assembly and is assigned 4 words of data.</p> <table> <tbody> <tr> <td>Data Offset (Double Words):</td> <td>0</td> </tr> <tr> <td>Data Offset (Bits):</td> <td>0</td> </tr> <tr> <td>Length (Bits):</td> <td>80 5 words (* 2 bytes per word
* 8 bits per byte)</td> </tr> </tbody> </table> <p>80 bits is actually 5 words of data, the fifth word is not used in this example. and included for so that all bits of data were accounted for.</p> | Data Offset (Double Words): | 0 | Data Offset (Bits): | 0 | Length (Bits): | 80 5 words (* 2 bytes per word
* 8 bits per byte) |
| Data Offset (Double Words): | 0 | | | | | | |
| Data Offset (Bits): | 0 | | | | | | |
| Length (Bits): | 80 5 words (* 2 bytes per word
* 8 bits per byte) | | | | | | |
| OB32 | <p>(appears as Generic Module) - This module appears next (an offset of 80 bytes corresponds to 2 32-bit double words and 16 bits) and is assigned 2 words of data.</p> <table> <tbody> <tr> <td>Data Offset (Double Words):</td> <td>2</td> </tr> <tr> <td>Data Offset (Bits):</td> <td>16</td> </tr> <tr> <td>Length (Bits):</td> <td>32
2 words (*2 bytes per word
* 8 bits per byte)</td> </tr> </tbody> </table> | Data Offset (Double Words): | 2 | Data Offset (Bits): | 16 | Length (Bits): | 32
2 words (*2 bytes per word
* 8 bits per byte) |
| Data Offset (Double Words): | 2 | | | | | | |
| Data Offset (Bits): | 16 | | | | | | |
| Length (Bits): | 32
2 words (*2 bytes per word
* 8 bits per byte) | | | | | | |
| OF4I | <p>This module has an offset of 112 (80 plus 32) and will complete the output assembly with 5 words of data.</p> <table> <tbody> <tr> <td>Data Offset (Double Words):</td> <td>3</td> </tr> <tr> <td>Data Offset (Bits):</td> <td>16</td> </tr> <tr> <td>Length (Bits):</td> <td>80
5 words (* 2 bytes per word
* 8 bits per byte)</td> </tr> </tbody> </table> | Data Offset (Double Words): | 3 | Data Offset (Bits): | 16 | Length (Bits): | 80
5 words (* 2 bytes per word
* 8 bits per byte) |
| Data Offset (Double Words): | 3 | | | | | | |
| Data Offset (Bits): | 16 | | | | | | |
| Length (Bits): | 80
5 words (* 2 bytes per word
* 8 bits per byte) | | | | | | |

The entire output assembly (192 bits) is accounted for and each output module has a separate space.

14. Save this configuration by clicking OK once you have finished entering this data.
15. Download and activate the DNET_DEVICE.

Once these steps are complete Input and Output channels may be configured to map to these locations.

Configure Input and Output Channels

Create a new CM

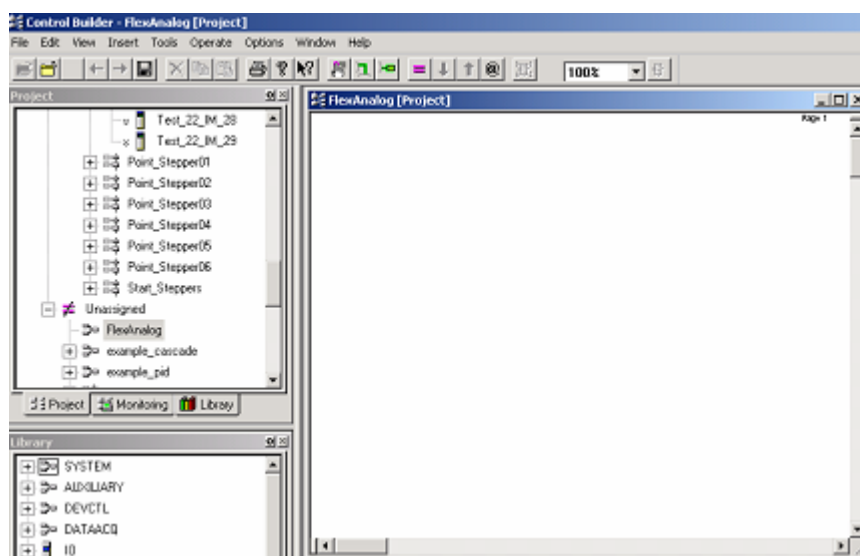
1. Go to the Project tab.
2. Click **File** ⇒ **New** ⇒ **Control Module**.

This new CM should appear in the Unassigned section of the Project tab.

3. Give it a unique name (ours is called Flex_Analog).
4. Assign it to the CPM to which your DNET_IM blocks and DNET_DEVICE are assigned.

If your blocks are all unassigned, you should do so at this time. If necessary create a new CPM.

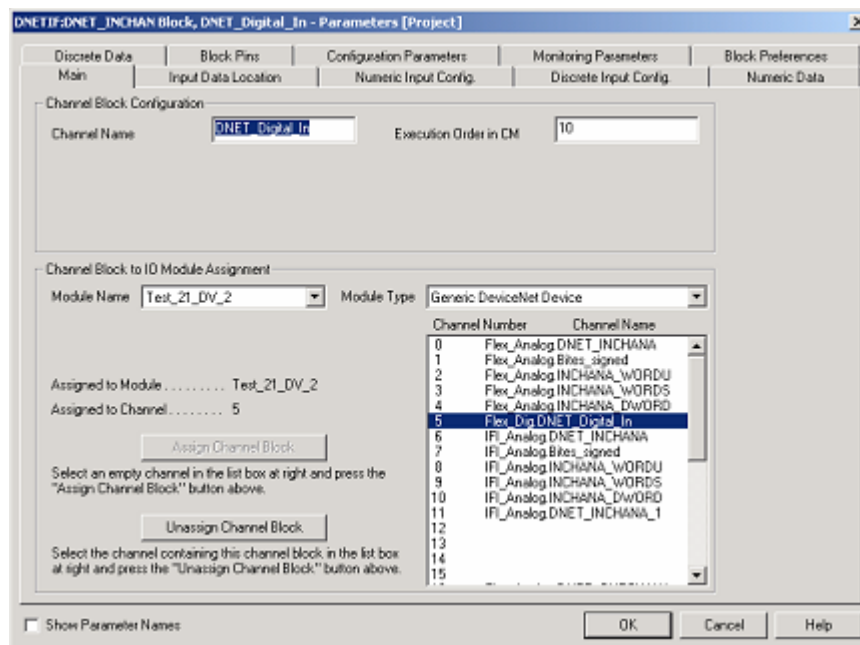
5. Click on the CM to drag and drop function blocks into it.



Set-up communication with the 1794-IE8/1794-OE4 pair

Input Channel

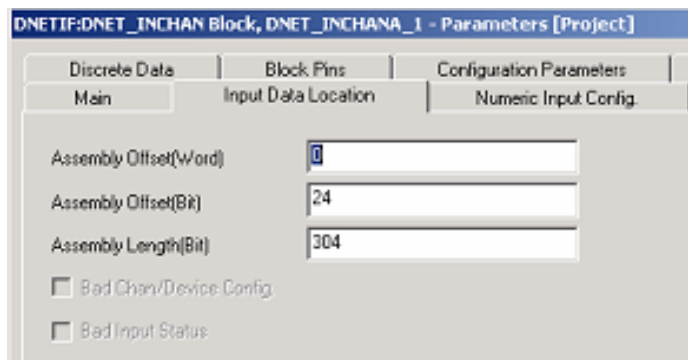
6. Drag and drop a DNET_INCHAN from the Library tab.
7. Double click the block to display the block parameters form.



8. Select the appropriate Module Name from the drop down list to associate this input channel with the correct device.
9. Click **Assign Channel Block** to complete the association.

Your screen should look similar to the above picture when you are finished. You can chose any available channel to assign, it does not need to be channel 5.

10. Select the Input Data Location tab.



11. Enter the correct information to match the Input Data Format table on the Module Configuration tab for the DNET_DEVICE block.

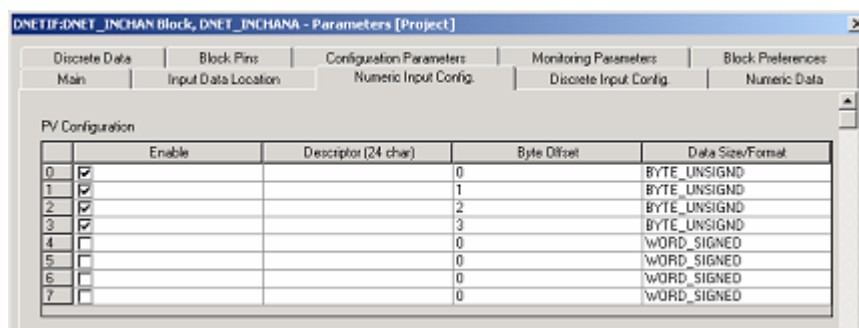
Refer to Locate Mapping Data from RSNetworx on page 3-8, for the module configuration example.

IMPORTANT

This data **MUST** match what is entered into the Input Data Format table in the DNET_DEVICE block or the input channel will not operate.

Use Steps 6-11 to configure the way that the Main and Input Data Location tabs for all input channels for this device (the ADN adapter). Use the Numeric Input Config tab or Discrete Input Config tab to indicate offsets for each individual module.

12. Select the Numeric Input Config. tab.

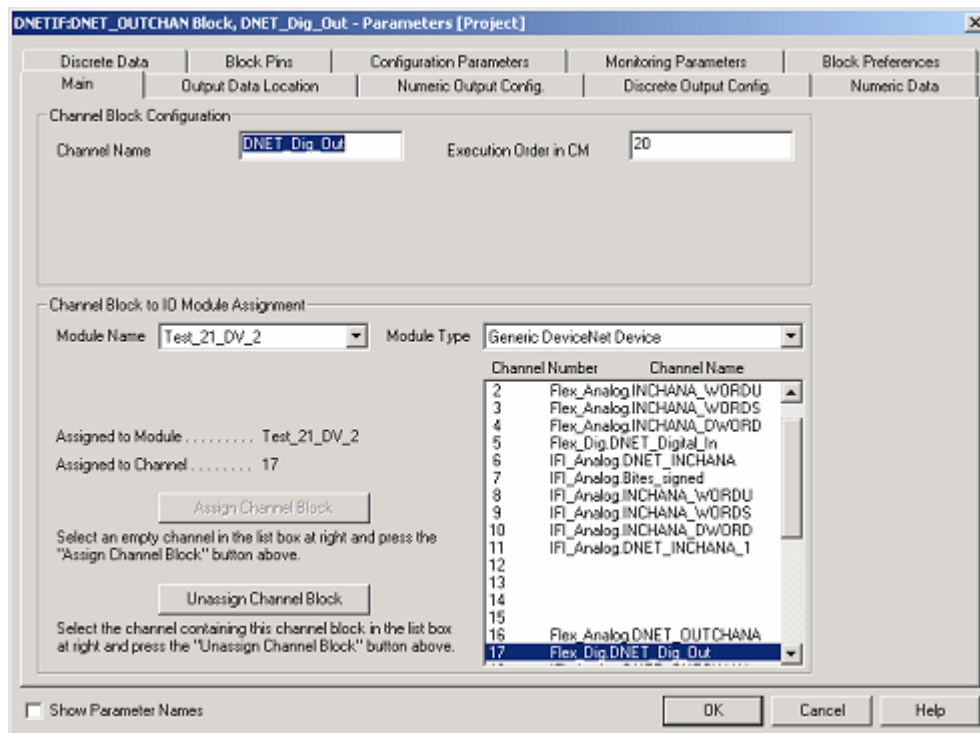


The byte offset column indicates the location in the input data assembly that we are attempting to read. This offset is relative to the Input Data Location that was specified in the Input Data Location tab. In this example, the input of the IE8 is the first module in the data assembly. Therefore in this case we are reading in the general ADN status word and the first 2 bytes of data from the IE8. Refer to page 3-13 for RSNetworx data.

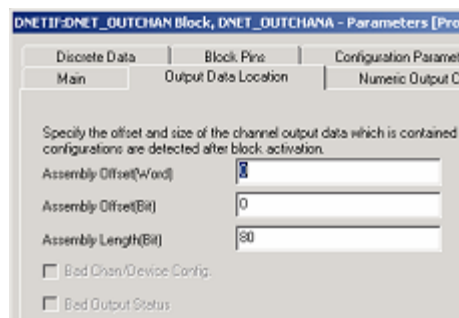
13. Select the desired number of numeric inputs for this block and set offsets accordingly (if you are using discrete modules, see the next example on page 3-23)
14. Click **OK** to save changes and exit block parameters.

Output Channel

1. Drag and drop a DNET_OUTCHAN block from the Library tab.
2. Double click on the block to display the block parameters form.



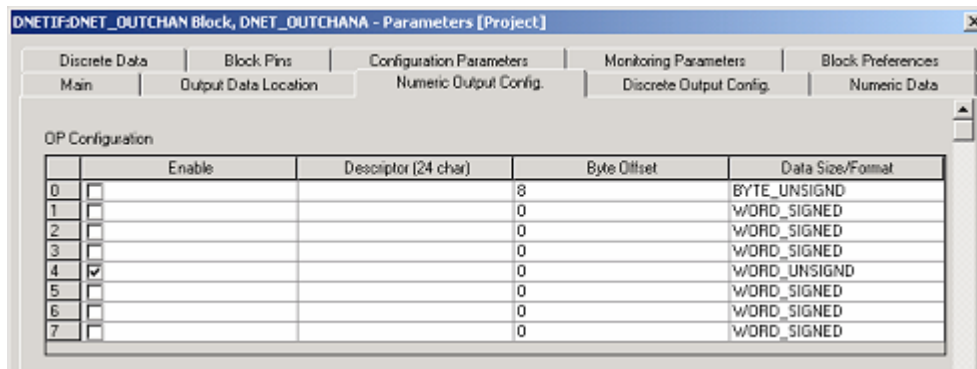
3. Assign the block to the DNET_DEVICE just as you did for the Input channel.
4. Select the Output Data Location tab.



5. Enter the correct information to match the Output Data Format table on the Module Configuration tab for your device.

Refer to the example on page 3-18. In our example this data matches the location of the OE4 that we called out on page 3-18. This data MUST match one of the entries in the Output Data Format table in the DNET_DEVICE block in order for the output channel to operate correctly.

6. Select the Numeric Output Config. tab.



This tab is exactly the same for an INCHAN as it is for an OUTCHAN. Byte Offsets are still relative to the data space selected in the Output Data Location tab. In this example, we are writing to the first channel of the OE4 (with pin 4 enabled).

7. Select the desired number of numeric outputs for this block and set offsets accordingly (if you are using discrete modules, see the next example on page 3-23)
8. Click **OK** to save changes and exit block parameters

Set-up communication with the 1794-IB32/1794-OB32 pair

Input channels

1. Select and set up a new DNET_INCHAN (Main and Input Data Location tabs) just as you did for the IE8.

2. Select the Discrete Input Config tab.

	Enable	Descriptor (24 char)	Byte Offset	Bit Offset	Input Bad Option
0	☒		18	0	OFF
1	☒		18	1	OFF
2	☒		18	2	OFF
3	☒		18	3	OFF
4	☒		18	4	OFF
5	☒		18	5	OFF
6	☒		18	6	OFF
7	☒		18	7	OFF
8	☒		19	0	OFF
9	☒		19	1	OFF
10	☒		19	2	OFF
11	☒		19	3	OFF
12	☒		19	4	OFF
13	☒		19	5	OFF
14	☒		19	6	OFF
15	☒		19	7	OFF
16	☒		20	0	OFF

Because we referenced the entire Input assembly in the Input Data Location tab, we must set the byte and bit offsets here to point the input block to the correct space in the memory of the DNB. We know that the input of the IB32 is offset 9 words (18 bytes) from the beginning of the input assembly (see example page 3-13). This setup enables each individual flag to be read through one pin on the block.

3. After you have finished enabling channels and assigning appropriate offsets, click **OK** to save changes and exit the form.

Output Channels

1. Select and set up a new DNET_OUTCHAN block just as you did for the OE4; however **ONLY** set up the Main tab
2. Select the Output Data Location tab.

Specify the offset and size of the channel output data which is contained within the configurations are detected after block activation.

Assembly Offset(Word)

Assembly Offset(Bit)

Assembly Length(Bit)

☐ Bad Chsn/Device Config.

☐ Bad Output Status

3. Enter the correct information to match the Output Data Format table on the Module Configuration tab for your device.

Refer to the example on page 3-18. In our example this data matches the location of the OB32 described on page 3-18. This data **MUST** match one of the entries in the Output Data Format in the DNET_DEVICE block table in order for the block to operate correctly.

4. Select the Discrete Output Config tab.

	Enable	Descriptor (24 char)	Byte Offset	Bit Offset
0	☒		0	0
1	☒		0	1
2	☒		0	2
3	☒		0	3
4	☒		0	4
5	☒		0	5
6	☒		0	6
7	☒		0	7
8	☒		1	0
9	☒		1	1
10	☒		1	2
11	☒		1	3
12	☒		1	4
13	☒		1	5
14	☒		1	6
15	☒		1	7
16	☒		2	0

Because we referenced a small chunk of the Output data assembly, the information for the OB32 starts at the beginning of that chunk. The byte and bit offsets only need to be set to point to places within the data space we have already referenced. This setup enables each individual flag to be read through one pin on the block.

5. After you have finished enabling channels and assigning appropriate offsets, click **OK** to save changes and exit the form.

Set-up communication with the 1794-IF4I/1794-OF4I pair.

6. Follow the same procedure as described in the section Set-up communication with the 1794-IE8/1794-OE4 pair on 3-20. Below are example screens.

Input Channels

	Enable	Descriptor (24 char)	Byte Offset	Data Size/Format
0	☒		22	DWORD_SIGNED
1	☐		0	BYTE_UNSIGNED
2	☐		0	BYTE_UNSIGNED
3	☐		0	BYTE_UNSIGNED
4	☐		0	WORD_SIGNED
5	☐		0	WORD_SIGNED
6	☐		0	WORD_SIGNED
7	☐		0	WORD_SIGNED

The IF4I is offset by 22 bytes (11 words*2 bytes per word).

Output Channels

Specify the offset and size of the channel output data which is contained within configurations are detected after block activation.

Assembly Offset(Word):

Assembly Offset(Bit):

Assembly Length(Bit):

☐ Bad Chn/Device Config.

☐ Bad Output Status

	Enable	Descriptor (24 char)	Byte Offset	Data Size/Format
0	☐		8	BYTE_UNSIGNED
1	☐		0	WORD_SIGNED
2	☐		0	WORD_SIGNED
3	☐		0	WORD_SIGNED
4	☒		2	DWORD_SIGNED
5	☐		0	WORD_SIGNED
6	☐		0	WORD_SIGNED
7	☐		0	WORD_SIGNED

This offset is set to 2 bytes because the first word of output to the OF4I is for filter settings. Please refer to your device specific manual(s) for more information about write/read locations within the data structure.

After you have configured the Input and Output Channels, download and activate the new CMs.

Troubleshooting

Hardware

1756-DNB

DNB Error Codes

Refer to the ControlLogix DeviceNet Interface Module User Manual, 1756-6.5.19.

Software

RSNetworx for DeviceNet

Changing Hardware

When changing some device configuration information (channel states, etc.) Be sure that the device is not assigned to the DNB scanner list. If the device is still assigned, changes may not be saved.

Control Builder

Device is red but IM is green

Make sure IM is in RUN mode.

Configuration mismatch error on download

This error can be triggered by several configuration mistakes. With DeviceNet, this error could mean that the Data Offset (DWORDS), Data Offset (BITS), and Data Length (BITS) within an input or output channel does not match the information in the corresponding DNET_DEVICE block.

Data not reflected in module or device

Check mapping in RSNetworx for DeviceNet to verify Inchan/Outchan block is pointing to correct space in DNB memory.

Notes:



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Publication 1756-AT007B-EN-P - August 2003

Supersedes Publication 1756-AT007A-EN-P - September 2002

PN 957824-87

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